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Standardization of Postoperative Care Guidelines for Pediatric Cleft Palate Patients

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Abstract

At a large, community-based pediatric hospital in Southern California, a quality improvement project commenced with a goal to improve patient outcomes by decreasing length of stay and pain levels, while increasing toleration of feeds. Implementing a standardized guideline would ensure safe practice across the continuum and allow providers to use a systematic tool for postoperative care, including nursing care interventions and medications. The Root-Cause-Analysis tool was used to assess the microsystem and determine the contributing factors to the identified problem. A SWOT analysis was then performed, followed by a plan to collect data from all pediatric cleft palate procedures performed at the hospital within the last year. The data collected included all necessary actions that took place upon patient's exit from surgery. Patient exclusion criteria included PICU admits and those with cleft palate repair resulting from injury. The patients that fell within the exclusion criteria were excluded due to the increased risk and complications that these conditions bear. Considerations for care guideline use include: congenital abnormalities of the heart, brain, or gastrointestinal system as well as those with hematology or oncology conditions and developmental delays. Research was then performed on the patient information found from chart audits, in order to verify the best practices following postoperative cleft palate repair. Ultimately, research on the impact of care guidelines on postoperative cleft palate repair versus physician preference yielded a recommendation for the development of standardized care guidelines, however, the results showed that additional steps are needed to evaluate the results of this implementation on length of stay, pain levels, and time of first tolerated feed.

Standardization of Postoperative Care Guidelines for Pediatric Cleft Palate Patients

Cleft palate is a well-known birth defect that occurs when the roof of the baby's mouth, or palate, does not join together completely during weeks six and nine of pregnancy. The severity of cleft palate varies from baby to baby, but leaves children with difficulties in feeding, speaking, growth, teething, and may even cause other infections. According to the Centers for Disease Control and Prevention (CDC), approximately 2,650 babies are born in the United States with cleft palate each year, making cleft palate defects, one of the most common types of birth defects (Centers for Disease Control and Prevention, 2019). Due to the prevalence of cleft palate in the United States, these orofacial clefts are commonly fixed by route of surgery in an attempt to improve all factors mentioned previously, while also improving the psychological health of patients dealing with the abnormality. Due to the fact that cleft palate birth defects may lead to many other detrimental health effects, it is important to address this issue in a timely manner, and use optimal, evidence-based care to ensure positive outcomes and prevent adverse effects.

Surgical techniques for cleft palate repair are continually changing and vary from surgeon to surgeon. Despite the variance between surgical techniques, however, the goal of surgery remains the same for all surgeons- to repair the problem while optimizing patient outcomes. With this goal in mind, it was adamant to the plastic surgeons of a large community based pediatric hospital in Southern California, to establish a standardized form of post operative care guidelines for the cleft palate repair patients of the hospital. This type of standardized care would allow patients to receive the most optimal, patient-centered care through the use of evidence based practice techniques. Based on current evidence-based research and the outcomes of standardized care guidelines within other units of the large-community based hospital, it was concluded that the need for a standardized postoperative cleft palate repair care guideline was

necessary. Based on the Theory of Change, in a setting that is constantly evolving, it is necessary to respond to these changes. With the knowledge that quality improvement efforts are necessary in health care settings, and in order for these projects to be successful, Kotter's Theory and the Model for Understanding Success in Quality were used to determine the framework to guide the planning, implementation, and evaluation stages of the quality improvement project. After the problem was identified, based on the gathered data and evidence-based research, the theory-driven approach was used to develop the framework of the Postoperative Cleft Palate Repair Care Guideline. The guideline was created in response to the needs of the microsystem to optimize care and improve care outcomes.

Current evidence suggests different approaches for surgical repair, yet for the purpose of this project, the postoperative care approaches were researched, assessed, and evaluated. Data was gathered from the microsystem within the large community-based children's hospital, including data from patient charts, nursing interventions, and physician orders. The gathered data was compared and evaluated, and evidence-based studies were used to determine current practices, and to compare outcomes. Using different interventions, techniques, and guidelines for postoperative care affects not only the patients, but the outcomes of the microsystem as a whole, and the entire organization. This is crucial as improved patient outcomes is the goal of the microsystem and the organization delivering the best possible care. In order to yield improved patient outcomes and prevent adverse effects, key stakeholders and the quality improvement committee set a framework in motion to develop a standardized care guideline which is aimed at improving outcomes based on current evidence and literature, three of which were outlined: length of stay, first tolerated feed, and pain management. Ensuring that the best possible techniques are used in order to meet these outcomes was the common goal of all stakeholders,

and creating a standardized tool that reflected these findings was the end goal and product of the QI project. The three quality outcomes addressed through this QI project, in turn, play an important role in improving overall quality, delivery of care, consistency of care, cost reduction, patient safety, patient satisfaction, and long-term well-being.

Problem description

At a large community based pediatric hospital in Southern California, just under fifty cleft palate repairs are performed per year. The hospital uses the most advanced surgical techniques and has met specific guidelines for working as an interdisciplinary team in order to optimize each child's growth and help them to look, eat and speak just like other children born without a craniofacial disorder. The two types of repairs performed involve cleft palate repair with or without iliac crest bone graft. The type of surgery performed depends on the severity of cleft palate at birth, and may involve more than one surgery to fully complete the repair. The postoperative period in the hospital falls just under 24 hours, with the first tolerated feeds occurring between hour 1 and hour 28, after the end of surgery, and pain levels ranging from 0-4 upon discharge. The purpose of this study was to research the best evidence-based postoperative practice techniques used to minimize length of stay and pain levels while also improving feeding after cleft palate repair surgery. This information was applied to create standardized postoperative cleft palate repair care guidelines for use throughout the hospital.

The Root Cause Analysis (RCA) analysis tool was used to assess the microsystem and identify the root cause of the identified problem. The identified problem and microsystem analysis can be seen in Appendix A. The identified issue was that at the present time, there was no standardization of care for patients undergoing a cleft palate repair, thus, allowing physicians to individualize their order sets, therefore, affecting overall patient outcomes. Using the root-

cause-analysis tool, contributing factors were identified and synthesized in the following categories: people, environment, methods, materials, and measurements. The people, or population involved includes: pediatric patients, parents, surgeons, care partners, nurses, administration, and the clinical nurse leader(s). Environmental factors include: the medical/surgical floor, the ICU and OR, as well as a busy environment which may not allow for optimal teaching and education time with patients regarding post-operative education. Another factor that plays a crucial role in contributing to the identified problem includes the methods surgeons use at present: individual order sets to care for clients which influence the nursing interventions used to care for patients on the specific unit and microsystem. The materials identified include: lack of care guidelines for cleft palate repair, post-operative orders that are pre-set and additional orders (dependent) on physician preference, lack of adequate machines available to take vitals at scheduled times, and the accessibility (or lack of accessibility) of orders on the EHR. Finally, the measurements used were also identified as contributing factors, and include: differing measurement tools used for data collection and measuring outcomes per physician preference, and postoperative complication data collected per unit as opposed to per type of surgery.

Available knowledge

Throughout the study and research phases during the initial stages, the following were considered: patient population, intervention, and the comparison intervention. As the quality improvement (QI) intervention was to be completed at the large community-based children's hospital, the focus of the QI intervention was the pediatric cleft palate repair population. The intervention to be assessed was the standardization of care through the use of care guidelines, being compared with individual physician preference. The two interventions were compared to

determine which technique resulted in improved patient outcomes. The following question was determined: in pediatric cleft palate repair, how does standardization of care through the use of care guidelines, compared to individual physician preference, affect overall care outcomes including: length of stay, first tolerated feed, and pain management?

Current available knowledge and research aims to address this question, and based on the outcomes of multiple studies, meta-analysis and synthesized data, it was determined that implementing a standardized tool/guideline for care interventions and data set orders, improved care outcomes, delivery of care, patient length of stay, adverse events, and reduced costs of care for hospitals and patients (Akenroye, Baskin, Samnaliev, & Stack, 2014; Hasegawa et al., 2016; Chang, Wilson, Chin, Friedman, & Jackson, 2017; Johnson, Arnold, Gay, O'Connor, O'Kelly, & Moore, 2018; Rutman, Migita, Spencer, Kaplan, & Klein, 2016; Shalom, Shahar, Parmet, & Lunenfeld, 2015). Current literature supports the use of standardizing care and implementing standardized care guidelines in various care settings (Hasegawa et al, 2016; Reed, Kaplan, & Ismail, 2018). Based on the existing knowledge, the standardization of care guidelines in specific microsystem settings is supported by the most current evidence, and thus, the aim of the QI intervention was focused on using this data to create and implement the desired outcomes through this project implementation.

Rationale

Clinical care is continually being evaluated, assessed, and re-defined to meet patient needs and to ensure high-quality, cost-effective care. Guidelines and standard procedures are always evolving to meet the changing needs of the patient population and standards of care. According to the Theory of Change (TOC), planning, implementing, and evaluating current practices with a theory-driven approach can strengthen the framework and guide quality

improvement (Silva et al., 2014). Kotter's theory states that in order for change to occur, the following eight steps need to be adequately established, which were to analyze readiness and to plan for change within the identified microsystem: "establishing a sense of urgency, creating the guiding coalition, developing a vision and strategy, communicating the change goals/vision, empowering broad-based action, generating short-term wins, consolidating gains and producing more change, and anchoring new approaches in the culture" (King & Gerard, 2016). Quality improvement projects are continually being implemented to ensure that the most current, evidence-based practices are being followed and applied within the specific microsystem and clinical setting. The need for quality improvement is initiated as a response to an identified problem within a microsystem, and after thorough evaluation of the problem and identification of the root cause of the identified issue, the gathered data is compared with current evidence-based literature. The large, community-based children's hospital identified the need for change in post-operative care for cleft palate surgical repairs. The large community-based hospital implemented standardized care guidelines in other post-operative care settings, and noticed improved outcomes and effectiveness of utilization of care procedures. This theory was then researched to determine whether standardizing care, with the implementation of care guidelines was an effective measure in improving care outcomes.

Multiple studies have looked at the theories and rationale behind standardizing care. One study concluded that implementing a standardized clinical practice guideline safely reduced length of stay, re-admissions, ICU services, and costs in a similar pediatric hospital setting (Johnson, Arnold, Gay, O'Connor, O'Kelly, & Moore, 2018). Another study which looked at postoperative cleft repair at a large academic medical center, concluded that standardized patient instructions significantly increased adherence to physician instructions (Chang, Wilson, Chin,

Friedman, & Jackson, 2017). Other studies have looked at whether a standardised care guideline was effective and useful, and concluded that effective utilization of the standardised care guidelines was in fact associated with positive outcomes, decrease in adverse effects, decrease in hospital length of stay, decrease of need for specific medication, and proved to be cost effective for both patients and hospitals (Akenroye, Baskin, Samnaliev, & Stack, 2014; Hasegawa et al., 2016; Chang, Wilson, Chin, Friedman, & Jackson, 2017; Rutman, Migita, Spencer, Kaplan, & Klein, 2016; Shalom, Shahar, Parmet, & Lunenfeld, 2015). Based on the Model for Understanding Success in Quality (MUSIQ) and considering The Theory of Change, in addition to Kotter's Theory within our specific microsystem at the large community-based children's hospital, guides the steps in implementing a framework that focuses on the contextual factors within the microsystem and identifying the readiness for change. The evidence-based findings and theory-driven approach was the driving force behind the need for the quality improvement project, and helped us to identify the current practices as well as the rationale behind our research and implementation (Kaplan, Provost, Froehle, & Margolios, 2011). In order to implement a quality improvement project that will be successful, it is important to consider the contextual factors of the microsystem, as well as current evidence-based practices, which have been used and implemented to create the standardized Postoperative Cleft Palate Repair Care Guideline. This theory was used as a tool for identifying the roles of the different factors that influenced the success of our quality improvement project, and determined that, based on literature review, the implementation of standardized care guidelines proved to be effective and yield positive outcomes, thus, was determined to be created and implemented within our microsystem (Hasegawa et al, 2016; Reed, Kaplan, & Ismail, 2018).

Specific project aim

The specific aim of the project was to ensure that the best possible postoperative care techniques are used, according to the most current evidence-based practice and research to meet the desired outcomes: minimize length of stay and pain levels while also improving feeding after cleft palate repair surgery. After determining the best practices and techniques, the creation of a standardized tool that reflected these findings was the end goal and product of the QI project. The aim of the quality improvement effort was to overall improve patient outcomes and decrease the length of stay, and have consistent outcomes despite different operating physicians. Patient safety is a priority, and providing a guideline that is aimed at consistency of care and postoperative care techniques and interventions to ensure safe practice across the continuum is crucial, allowing for all care providers to use a systematic, standardised tool for postoperative care including nursing care interventions and medications. According to the most current research, the utilization of a standardized care guideline in a setting such as the specific microsystem within the large community-based children's hospital, has shown a positive correlation in the specific outcomes (Hasegawa et al., 2016; Chang, Wilson, Chin, Friedman, & Jackson, 2017 Rutman, Migita, Spencer, Kaplan, & Klein, 2016; Shalom, Shahar, Parmet, & Lunenfeld, 2015). These outcomes which correlate with the goals and outcome aim of the project include: decreasing length of stay, improving care outcomes (such as tolerating feeds appropriate for age) and decreasing costs (including those associated with pain medication). The aim of the quality improvement project reflects those of current evidence research and practices to improve patient quality of care and outcomes.

Methods

In order to determine how to carry out a care guideline for pediatric postoperative cleft palate repair patients, it was first necessary to seek what required attention. It began with a

request from the surgeons that conduct said cleft palate repairs. They requested that the hospital provide a guideline that would assist in standardizing care for their postoperative pediatric patients. As previously mentioned, the importance of standardizing care creates positive patient outcomes and decreases the likelihood of having a negative outcome that can greatly affect the hospital. Not to undermine the request of a medical professional, before a care guideline can be created, there are steps that need to be taken. Initially, it begins with assessments and analyses that will prove that a care guideline indeed is needed, including a microsystem assessment, IHI culture assessment, and a SWOT analysis, to name a few. After having conducted the aforementioned, it was recognized that a postoperative care guideline for a cleft palate repair did indeed need to be created.

Microsystem assessment

When thinking of implementing a new project to a microsystem, it is best to conduct a microsystem assessment to see if the microsystem will indeed benefit from said project. Also, to see if the project will be sustainable; will the microsystem be able to uphold the project and not let it fail. For the latter, the assessment can also help in recognizing what areas of the microsystem are lacking to make said project sustainable. After the surgeons' request for a care guideline for cleft palate repairs, a microsystem assessment was conducted. It must be mentioned, the microsystem for this specific project is not a usual microsystem that a Clinical Nurse Leader has a tendency to work with. It did not focus on a specific unit and its quality measures. The microsystem in this project is specific to the care of patients that have undergone a cleft palate repair at this pediatric hospital. The microsystem assessment was conducted in order to follow the care of postoperative patients, not so much the unit to which they would have been transferred to after their surgery. The clinical microsystem assessment tool was gathered

from the Institute for Healthcare Improvement (IHI) (See Appendix B). After being conducted, it was evident that the facility does in fact have enough support and assistance to make sure that this project is sustainable. Should there be any problems with the care guideline, the facility also has enough resources to help in editing the guidelines and make changes accordingly (IHI.org, 2019).

IHI culture assessment

According to IHI, the culture assessment tool is used to for organizations to develop "[A] culture that supports respect, communications, and communication after an adverse event" (IHI.org, 2019). This will allow for better communication between the organization and the patients and their families. Standardization of care is meant to prevent an adverse event, however this assessment tool will help recognize if the correct tools are in place to allow for clear communication between an organization and their patients and/or their family members. This will allow for better patient outcomes, which is the goal of standardizing care, specifically creating a care guideline for postoperative patients after having undergone a cleft palate repair. After having conducted the IHI culture assessment tool (See Appendix C), it was clear that the organization has the resources and already allows for a just and respectful communication and is well prepared should an adverse event occur.

Return on Investment (ROI) plan

A return on investment measures the profitability of an investment. At this stage, the project is to merely create a care guideline that would, once again standardize the care of a postoperative patient having undergone a cleft palate repair. In standardizing care, the goal is to prevent the hospital from having to invest more finances, therefore having a high ROI. The facility would gain more from investing in this care guideline relative to the cost of

implementing the project. It was discussed with the facility's clinical nurse specialist, that in implementing the guideline, the expected result is to decrease the patient's hospital stay, which would result in the hospital gaining revenue.

Another concern was readmission rates related to cleft palate repairs. If a patient is to be readmitted to a facility within 30 days of initial discharge, the hospital is responsible for funding the cost of the patient's care. Providing staff with this care guideline and therefore set a protocol with order sets would lower the chance of a readmission. Once the care guideline is in practice, the facility would be able to get data on whether the project was a success and drive up the ROI. However, the ROI will remain unknown until administration accepts the guideline, puts it into practice and then is able to gather data on whether the implementation of the project was able to gain the facility more revenue, than what it costs to implement it.

Communication plan

This specific care guideline, for the care of a postoperative cleft palate pediatric patient, is aimed to ameliorate communication between staff by standardizing care. This will prevent adverse events from occurring because they will follow a protocol that is provided by the said care guideline. This protocol is to set boundaries that will prevent an abundance of possibilities from occurring due to the fact that different surgeons used to have different care instructions postoperatively. It is expected to have exceptions to the guideline, but this would be for situations in which the surgeon thinks that the client would benefit from a different order set; not a part of the protocol.

When conducting research through auditing charts, it was apparent that there was a lack of communication through charting. The charts provided the group with enough information to see that staff were not documenting follow up notes. Staff were also not following up with

patients after discharge. If they were indeed following up with the patients, there was a lack of documentation. The goal of these care guidelines are to keep constant communication with staff and their patients, even after discharge. The protocol that was in place prior to this new guideline, was apparently not working and therefore not sustainable enough to keep in place.

SWOT Analysis

A SWOT analysis was performed to assess the readiness of the surgical unit. This evaluation determined the staff's need and desire to change their current practices and adopt a new care guideline for cleft palate repair procedures. The SWOT analysis tool (See Appendix D) was used to validate the necessary changes to the care guidelines as well as project the success of the project and its outcomes. This assessment sheds light on any detriments that may halt or deter the progress of the project as well as highlight the strengths and opportunities the microsystem may bring to the project. The clinical nurse specialist on the unit helped guide this analysis and evaluated the overall benefit of this project for the microsystem. The acronym, SWOT, stands for strength, weaknesses, opportunities and threats. The strengths perceived were as follows; staff expertise, previous experience with the cleft palate repair procedure, familiarity with the surgeon's current order sets, background in family and patient education, electronic health record advantages, detailed history of current care guidelines in place. Weaknesses found included; lack of standardization, misuse of current care guidelines, undocumented postoperative education protocol, management issues regarding the delivery of postoperative education and care guidelines. Opportunities for this project aligned with the weaknesses discovered as they guided the necessary changes required; high demand for standardization protocol and guidelines for cleft palate repair postoperative education, surgical team request for a new care guideline and stakeholder's desire to streamline care guideline process. Threats to the success of this project

were minimal; potential lack of readiness of current healthcare staff for new care guideline adoption, lack of time for the evaluation aspect of the project, possible surgical team competition, varied protocols for cleft palate repair procedures, disorganization of protocols. This SWOT analysis assisted the team in developing the project's goals and outcomes. Due to the surgical team's specific request for a refined and standardized care guideline, the strengths and opportunities for this project outweighed the weaknesses and threats. Although the timeline for this project was shortened by cause of the team's limited time implementing the new care guideline, the outcome forecast is favorable.

Intervention

The intervention plan included a data collection method from all pediatric cleft palate repair procedures performed within the last year (See Appendix E). The clinical nurse specialist and nurse coordinator on the hospital's surgical unit were consulted to decide on a plan of action for creating a streamlined standardization of care. The beginning stage of the intervention included chart auditing for pediatric patients who received cleft palate repair procedures within the last year. A thorough investigation began with dissecting each patient's chart, recording all necessary actions that took place after the procedure. This included all orders from the physician, surgical and nursing notes and examining patient timelines during their stay. A calculation of the data gathered was then performed. The research aspect of the project encompassed a literature review of current cleft palate repair procedures as well as varied care guidelines, specific for this procedure, utilized in pediatric hospitals across the nation. Both data sets were used to disseminate the common parameters and practices for this procedure, any outliers were discarded.

Measurement Strategy

The chart auditing process included recording the inclusion (postoperative cleft palate repair patients) and exclusion (patients with congenital abnormalities of the heart, brain, or GI system, and PICU admits, patients with hematology or oncology conditions, and cleft palate repair resulting from palate injury) criteria. Patient charts reviewed included cleft palate repair with and without bone graft. The current physician order sets were also tallied to compare and contrast decision-making policies and protocols for each surgeon. After finalizing the data set and researching current care guidelines from other pediatric hospitals, the refined care guideline was produced (See Appendix G). This was constructed by calculating the most common order sets prescribed and creating a universal order set to be used by all surgeons. The evidence yielded three quality outcomes; length of stay, first tolerated feed and pain management. The top parameters for the new care guideline are as follows; post-operative assessment, post-operative interventions, medication management, and discharge criteria. Standardized protocols are included in the breakdown for each segment. Due to the timeline of this project, the final outcome and quality improvement trajectory will not be measured. However, an evaluation of the new care guideline and its effect on patient length of stay, first tolerated feed and pain management would be the next step in determining its success.

Ethical Considerations

Any time that one works with a facility that provides care to a client, one must adhere to strict Health Insurance Portability and Accountability Act (HIPAA) policy. When auditing charts, all client's personal information was excluded and not used for the purposes of this project. No client's personal information was taken from outside of the facility for research. When gathering information at the site of the facility, HIPAA privacy policy was strictly enforced. Computer screens were shut off, if computer was to be left alone, to protect client

information. The facility was aware of our involvement in doing research with their representative, the clinical nurse specialist. The care guideline was developed and written in a manner that has general information and would not ethically implicate or compromise any client, provider, staff member or the facility.

Results

Currently, the postoperative care guidelines for cleft palate repair have been approved and verified by the Clinical Nurse Specialist. However, additional steps are needed to successfully evaluate the results. First, a meeting with the key stakeholders is required to review and finalize the content of the care guidelines. The stakeholders include surgeons and members of nursing management at the large community based pediatric hospital. Next, the quality improvement committee will review and publish the "Postoperative Care Guidelines for Pediatric Cleft Palate Patients" for hospital use and finally the nursing staff will be educated on it's application.

In order to evaluate the effectiveness of the standardized postoperative care guidelines for cleft palate repair, three quality outcomes have been identified and will be evaluated. The three outcomes that will guide evaluations include length of stay, first tolerated feed, and pain management. Further data that is collected will reflect pre-implementation data collection techniques in which length of stay will be measured from time out of surgery to point of discharge while quality of feeding will be measured by the time of first tolerated feed. The age-appropriate pain scale will be used to identify the effectiveness of standardized pain management techniques at 4 hours, 8 hours, 12 hours, and discharge.

After evaluating the three components outlined above, the new care guidelines are expected to improve patient outcomes and decrease the length of stay regardless of the surgeon

performing the cleft palate repair. Also, the standardization of order sets will improve patient safety and consistency of care. With the expected outcomes, there are also potential savings in the total cost per day in the surgical unit.

According to hospital data, the total cost per day for a patient on the surgical unit is about $4,637 and can be further broken down to $193.20 per hour. This total includes direct costs associated with patient stay such as diagnostic testing, medications, and board as well as indirect costs related to overhead. For example, if the implementation of care guidelines reduces hospital stay by 4 hours, then it is expected that there will be a total cost savings of $772.83.

Discussion

The current CNL students were not able to evaluate the results after implementation. However, evidence-based research shows the negative impact of variation on patient outcomes and resource utilization. For example, Tieder et. al. (2014) found that a children's hospital who relied on varying resources resulted in increased readmission rates as high as 20.3 percent. Thus, the need for standardization of care is imperative in improving the quality of patient care. Lavelle, Schast, & Keren (2015) developed continuous quality improvement pathways to standardize care which can be used by all members of the health care team. The clinical pathways can be applied when measuring health, processes, and patient satisfaction, which in turn, improve the health of future generations. When implemented, the pathways resulted in decreased admission rates, unnecessary testing, and decreased length of stay (Lavelle et. al., 2015). In relation to current evidence-based research, it is expected that the standardization of care guidelines for cleft palate repair will yield positive results. The large community-based children's hospital in Southern California, that this care guideline will be implemented in,

already utilizes standardized care guidelines for other procedures as well as high variability diagnoses. This process has been proven to improve patient outcomes and satisfaction.

The key lessons learned are closely related to the processes, techniques used by surgeons, and individual patient needs. For instance, it was crucial to assess the unit's current processes; not all surgeons utilized order sets. This helped the CNL students identify gaps in care and move into the next steps in standardizing care. Also, it was found that surgeons had varying outcomes based on the techniques they used for cleft palate repair. Thus, it was beneficial to analyze the data and identify algorithms that yielded the safest and most efficient evidence-based practices. Lastly, it was important to consider that each patient requires an individualized plan of care; exclusion criteria should be sensitive to outliers to provide each patient with the best care possible.

There are many factors that lead to a successful change in hospital policy and patient care. At this large community-based children's hospital, a quality improvement team works with clinical nurse specialists throughout the system in order to identify patient needs, analyze current data, and formulate solutions. These collaborations rely highly on the PDSA model for guidance in implementation and evaluation. In addition, evidence-based research lays the foundation for change in each microsystem. Throughout the process, this quality improvement team includes stakeholders, such as nurses, physicians, and supportive staff in decision-making. After implementation, the health care team is educated about the content and the change is incorporated into patient care. Each member in the microsystem works together in an effort to improve patient outcomes through current care guidelines and standardizations of care.

Conclusion

In conclusion, care guidelines can be easily transformed to include other high risk, high volume, and high variability conditions. Currently, care guidelines are used in numerous large community-based children's hospitals in different areas of the United States as these standardizations of care can be easily replicated in various clinical settings. Quality improvement teams aim to continuously implement processes that will optimize patient safety, quality of care, and efficiency of delivery. Care guidelines ensure consistency of care and increase provider productivity, therefore, it is recommended that it be utilized by more hospitals across the country.

Quality improvement projects are consistently being evaluated and reformulated to meet patient care needs and maintain hospital standards. The care guidelines for postoperative cleft palate repair patients, like other guidelines, are continuously evolving to reflect the best current evidenced-based practices. CNLs are trained to carry out, lead, and maintain quality improvement projects within the microsystem. CNLs work directly with the health care team to implement cost-saving measures that will ultimately improve patient care outcomes and satisfaction. Therefore, this position plays a significant role in care guideline sustainability.

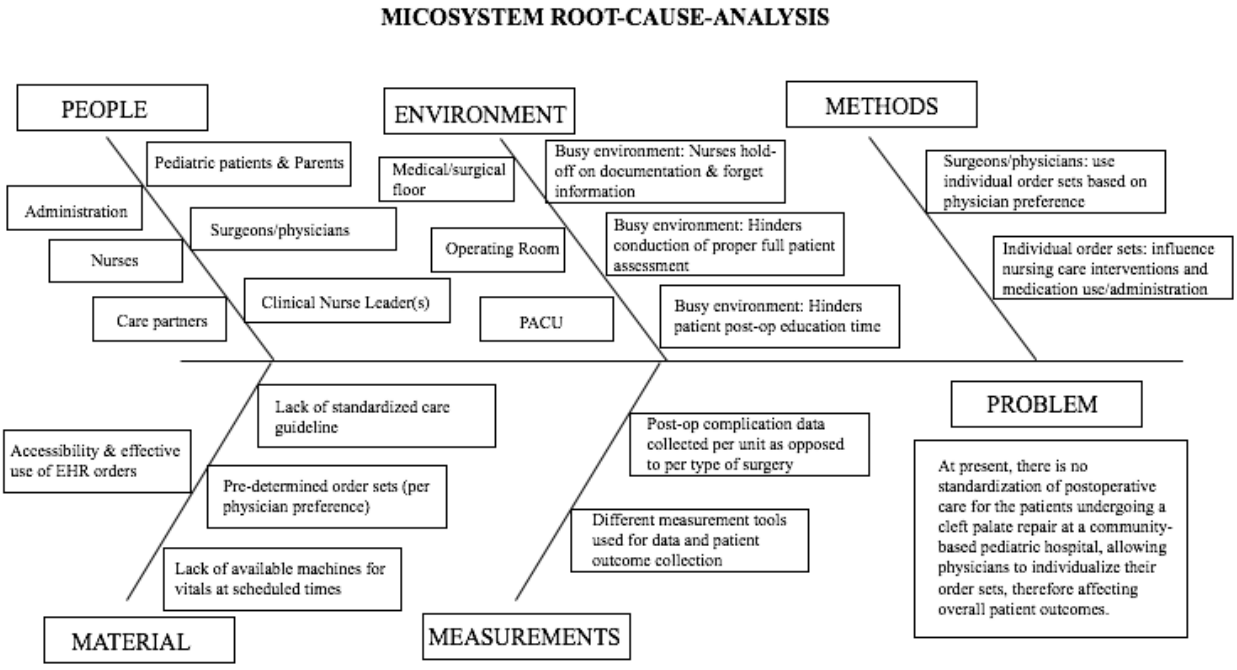
Overall, clinical pathways serve as a guideline for physicians and health care providers. However, it is certain that not all patients are the same and individual circumstances still need to be accounted for by physician orders (Children's Hospital of Philadelphia, 2019). To address these differences, considerations as well as inclusion and exclusion criteria are included in the care guidelines. Care guidelines are to be used in practice to mitigate error and decrease variability of patient outcomes in relation to physician order preferences (Lavelle et. al., 2015).

Through the QI process, at a large children's hospital, the team explored the impact of postoperative care guidelines on cleft palate repair compared to physician preferences. The three

outcomes that guided research and evaluation include length of stay, feeding, and pain management as these outcomes reflect patient-centered care. It is recommended that hospitals develop care guidelines or pathways in order to standardize care and minimize variation. Although every child is unique, it is certain that this technique optimizes patient safety and quality of care as well as patient outcomes.

Appendix A

Microsystem Root-Cause Analysis



Appendix B

Clinical Microsystem Assessment

CLINICAL MICROSYSTEM ASSESSMENT TOOL

Instructions: Each of the "success" characteristics (e.g., leadership) is followed by a series of three descriptions. For each characteristic, ***please check*** the description that ***best describes*** your current microsystem and the care it delivers *OR* use a microsystem you are *MOST* familiar with.

	Characteristic and Definition	Descriptions			
Leadership	**1. Leadership:** The role of leaders is to balance setting and reaching collective goals, and to empower individual autonomy and accountability, through building knowledge, respectful action, reviewing and reflecting.	☐ Leaders often tell me how to do my job and leave little room for innovation and autonomy. Overall, they don't foster a positive culture.	☐ Leaders struggle to find the right balance between reaching performance goals and supporting and empowering the staff.	☒ Leaders maintain constancy of purpose, establish clear goals and expectations, and foster a respectful positive culture. Leaders take time to build knowledge, review and reflect, and take action about microsystems and the larger organization.	☐ Can't Rate
	2. Organizational Support: The larger organization looks for ways to support the work of the microsystem and coordinate the hand-offs between microsystems.	☐ The larger organization isn't supportive in a way that provides recognition, information, and resources to enhance my work.	☐ The larger organization is inconsistent and unpredictable in providing the recognition, information and resources needed to enhance my work.	☒ The larger organization provides recognition, information, and resources that enhance my work and makes it easier for me to meet the needs of patients.	☐ Can't Rate
Staff	**3. Staff Focus:** There is selective hiring of the right kind of people. The orientation process is designed to fully integrate new staff into culture and work roles. Expectations of staff are high regarding performance, continuing education, professional growth, and networking.	☐ I am not made to feel like a valued member of the microsystem. My orientation was incomplete. My continuing education and professional growth needs are not being met.	☐ I feel like I am a valued member of the microsystem, but I don't think the microsystem is doing all that it could to support education and training of staff, workload, and professional growth.	☒ I am a valued member of the microsystem and what I say matters. This is evident through staffing, education and training, workload, and professional growth.	☐ Can't Rate
	4. Education and Training: All clinical microsystems have responsibility for the ongoing education and training of staff and for aligning daily work roles with training competencies. Academic clinical microsystems have the additional responsibility of training students.	☐ Training is accomplished in disciplinary silos, e.g., nurses train nurses, physicians train residents, etc. The educational efforts are not aligned with the flow of patient care, so that education becomes an "add-on" to what we do.	☐ We recognize that our training could be different to reflect the needs of our microsystem, but we haven't made many changes yet. Some continuing education is available to everyone.	☒ There is a team approach to training, whether we are are training staff, nurses or students. Education and patient care are integrated into the flow of work in a way that benefits both from the available resources. Continuing education for all staff is recognized as vital to our continued success.	☐ Can't Rate
	5. Interdependence: The interaction of staff is characterized by trust, collaboration, willingness to help each other, appreciation of complementary roles, respect and recognition that all contribute individually to a shared purpose.	☐ I work independently and I am responsible for my own part of the work. There is a lack of collaboration and a lack of appreciation for the importance of complementary roles.	☐ The care approach is interdisciplinary, but we are not always able to work together as an effective team.	☒ Care is provided by a interdisciplinary team characterized by trust, collaboration, appreciation of complementary roles, and a recognition that all contribute individually to a shared purpose.	☐ Can't Rate
Patients	**6. Patient Focus:** The primary concern is to meet all patient needs — caring, listening, educating, and responding to special requests, innovating to meet patient needs, and smooth service flow.	☐ Most of us, including our patients, would agree that we do not always provide patient centered care. We are not always clear about what patients want and need.	☐ We are actively working to provide patient centered care and we are making progress toward more effectively and consistently learning about and meeting patient needs.	☒ We are effective in learning about and meeting patient needs — caring, listening, educating, and responding to special requests, and smooth service flow.	☐ Can't Rate

Side A

Please continue on Side B

CLINICAL MICROSYSTEM ASSESSMENT TOOL

- CONTINUED -

	Characteristic and Definition		Descriptions			
Patients	**7. Community and Market Focus:** The microsystem is a resource for the community; the community is a resource to the microsystem; the microsystem establishes excellent and innovative relationships with the community.		We focus on the patients who come to our unit. We haven't implemented any outreach programs in our community. Patients and their families often make their own connections to the community resources they need.	We have tried a few outreach programs and have had some success, but it is not the norm for us to go out into the community or actively connect patients to the community resources that are available to them.	X We are doing everything we can to understand our community. We actively employ resources to help us work with the community. We add to the community and we draw on resources from the community to meet patient needs.	Can't Rate
Performance	**8. Performance Results:** Performance focuses on patient outcomes, avoidable costs, streamlining delivery, using data feedback, promoting positive competition, and frank discussions about performance.		☐ We don't routinely collect data on the process or outcomes of the care we provide.	☐ We often collect data on the outcomes of the care we provide and on some processes of care.	☒ Outcomes (clinical, satisfaction, financial, technical, safety) are routinely measured, we feed data back to staff, and we make changes based on data.	☐ Can't Rate
	9. Process Improvement: An atmosphere for learning and redesign is supported by the continuous monitoring of care, use of benchmarking, frequent tests of change, and a staff that has been empowered to innovate.		☐ The resources required (in the form of training, financial support, and time) are rarely available to support improvement work. Any improvement activities we do are in addition to our daily work.	☐ Some resources are available to support improvement work, but we don't use them as often as we could. Change ideas are implemented without much discipline.	☒ There are ample resources to support continual improvement work. Studying, measuring and improving care in a scientific way are essential parts of our daily work.	☐ Can't Rate
Information and Information Technology	**10. Information and Information Technology:** Information is THE connector - staff to patients, staff to staff, needs with actions to meet needs. Technology facilitates effective communication and multiple formal and informal channels are used to keep everyone informed all the time, listen to everyone's ideas, and ensure that everyone is connected on important topics. *Given the complexity of information and the use of technology in the microsystem, assess your microsystem on the following three characteristics: (1) integration of information with patients, (2) integration of information with providers and staff, and (3) integration of information with technology.*	A. Integration of Information with Patients	☐ Patients have access to some standard information that is available to all patients.	☐ Patients have access to standard information that is available to all patients. We've started to think about how to improve the information they are given to better meet their needs.	☒ Patients have a variety of ways to get the information they need and it can be customized to meet their individual learning styles. We routinely ask patients for feedback about how to improve the information we give them.	☐ Can't Rate
		B. Integration of Information with Providers and Staff	☐ I am always tracking down the information I need to do my work.	☐ Most of the time I have the information I need, but sometimes essential information is missing and I have to track it down.	☒ The information I need to do my work is available when I need it.	☐ Can't Rate
		C. Integration of Information with Technology	☐ The technology I need to facilitate and enhance my work is either not available to me or it is available but not effective. The technology we currently have does not make my job easier.	☐ I have access to technology that will enhance my work, but it is not easy to use and seems to be cumbersome and time consuming.	☒ Technology facilitates a smooth linkage between information and patient care by providing timely, effective access to a rich information environment. The information environment has been designed to support the work of the clinical unit.	☐ Can't Rate

Side B

Appendix C

IHI Culture Assessment

Assessment Tool—A Culture of Respect, Communications, and Disclosure

	Element**	Y	+-	N
Internal Culture of Safety	The organization is grounded in the core values of compassion and respect and the ethical responsibility to always tell the truth to the patient and family.	x		
	There is an expectation for ongoing communication, honesty, and transparency that is set from the board and leadership and closely monitored.	X		
	Error is seen as the failure of systems and not people.		X	
	All can expect support at the sharp end of unanticipated outcome and near-miss.	X		
Malpractice Carrier	There is a commitment to rapid disclosure and support.	X		
	There is a written understanding of how cases will be managed in partnership between patient/family/carrier.	X		
	Mechanisms are in place for rapid respectful resolution.	X		
Policies, Guidelines, Procedures	There is a policy on patient and family communications.	X		
	There is a policy on patient and family partnerships. Organizational infrastructure for clinician support exists.	X		
	There are policies on disclosure and documentation.	X		
	Procedures are known and in place for internal and external communication of sentinel events.	X		
	Guidelines/policies support a fair and just culture (non-punitive) and the reporting of adverse events.	X		
	There is a written crisis communication plan. This plan is centrally located and easily accessible by all staff.	X		
Training	Ongoing training programs are in place for all staff on communication, expectations, policies, procedures, guidelines.	X		
	There is just-in-time coaching (training) for disclosures.		X	
Disclosure Processes in Place	There is rapid notification of patient/family and activation of support—typically immediately around what is known.	X		
	There is a team to support staff preparing to disclose (coaches).	X		
	Root cause analyses commence immediately, are closely managed, and the results are shared, including with the patient and family.	X		
The Disclosure	The organization is transparent and honest.	X		
	Responsibility is taken.	X		
	We apologize/acknowledge.	X		
	There is a commitment to providing follow-up information.	X		
	The caregiver is supported throughout the process.	X		
	The organization provides continuing support for the patient/family.	X		
	All hospital staff disclosing are trained in their role	X		
Ongoing Support	Resources are available to assist families experiencing unanticipated outcomes (not limited to error) – support is defined by needs of the patient and family (e.g., emotional support).	X		
	Resources are available to assist staff at the sharp end of unanticipated outcomes (not limited to error) – based on the needs of the clinician (e.g., emotional support).	X		
	Procedures are in place and are known to ensure ongoing communications with patients, families, and staff.	X		
Resolution	Procedures are in place and are known to bring the case to closure respectfully, as viewed by the patient and family.	X		
Learning	Mechanisms are in place to ensure learning by the board, executive leadership, MSEC, and across the organization.	X		
	Measurement systems are in place to assess the impact of communication, disclosure, and support (as well as quality and safety) practices on premiums, claims, cases, and payments.	X		

***Adapted from Medically Induced Trauma Support Services (MITSS)*

Institute for Healthcare Improvement – DRAFT April 2008
We welcome feedback on this draft: contact Frank Federico at ffederico@ihi.org.

Appendix D

SWOT Analysis

Strengths	Weaknesses
Staff expertise, previous experience with the cleft palate repair procedure, familiarity with the surgeon's current order sets, background in family and patient education, electronic health record advantages, detailed history of current care guidelines in place	Lack of standardization, misuse of current care guidelines, undocumented postoperative education protocol, management issues regarding the delivery of postoperative education and care guidelines
Opportunities	**Threats**
High demand for standardization protocol and guidelines for cleft palate repair postoperative education, surgical team request for a new care guideline and stakeholder's desire to streamline care guideline process	Potential lack of readiness of current healthcare staff for new care guideline adoption, lack of time for the evaluation aspect of the project, possible surgical team competition, varied protocols for cleft palate repair procedures, disorganization of protocols

Appendix E

Data Gathered From Patient Charts (Chart Audit)

Post-Operative Orders

Pain Management/Meds (With Bone Graft)

Apply ice Q4H x 20 min	IIIIII
On-Q pain pump	I
Acetaminophen/hydrocodone	IIIIIIIIIIIIIIIII
Acetaminophen	IIIIIIIIIIIIIII
Lidocaine	IIII → stopped recording b/c standard
Ondansetron (Zofran)	IIIIIIIIIIIIIIIII
Cefazolin TID (Q8H x 24H)	IIIIIIIIIII
Unasyn	I
Chlorhexidine (Peridex) Swish/Spit TID	III
NS rinse	III
Morphine	IIIIIIIIIIIIIIII
Ibuprofen	II
Cephalexin (Keflex)	IIIIIIIII
Ampicillin	III IIII
Amoxicillin	I
Fentanyl	

Pain Management/Meds Cleft Palate Repair

Acetaminophen	IIIIIIIIIIIII
Morphine	IIIIIIIIIIIIII
Ondansetron (Zofran)	IIIIIIIIIIIIII
Ibuprofen	IIIIIII
Clindamycin	IIIIIII
Meperidine	IIII
Oxycodone	IIIIII
~~Ciprofloxacin~~	~~I~~ → Excluded b/c r/t ET tube placement
Hydromorphone	II III
Cefazolin	IIII
Cephalexin	II
Ampicillin	IIIII
Amoxicillin	

Post-Operative Orders

Discharge Criteria (With Bone Graft)

Oral Care Education	IIII
Ambulate	IIII
Void	III
PO Fluid Intake	IIIII

Surgical site infection prevention edu.	III
Lortab Q4-6H for pain	I
Oral rinse TID PRN (Chlorhexidine)	II
Saline spray 1 for each naris	I
Feeding: A. Clear liquid x 3D	IIIIIIIII
B. Full liquid x3 days s/p clear	IIIII
C. Soft diet > 6D post-op	IIIII
Abx Education	IIII
Pain mgmt education	IIIIIIII
Physical activity	II

Discharge Criteria (Cleft Palate Repair)

Alternating ibuprofen/Tylenol for pain Q3H	IIIIII
Antibiotic education	IIIIIII
Moving independently	I
Activity as tolerated	II
Tolerating feeds	II
Pain management teaching	IIIIIIIIII
Void	I

Hand hygiene education (parents)	II
Surgical site infection prevention edu.	Ill
Strict I & Os	I II

Diet/ Nutrition

Post-Operative Orders

Feeding (Bone Graft)

Clear Liquids x 3D s/p surgery	IIIIIIIIIIIIIIIIII
Record first tolerated feed in excel sheet (first tolerated feed=first feed after surgery w/ no emesis	
Full liquid	IIIIII
Advance diet for age	I

Feeding (Cleft Palate Repair)

Level 4 Pureed (OK sippy cup/syringe→ NO nipple, straw, utensils)	II
Breast milk	I
Breast feeding	I
Full liquid	IIIII

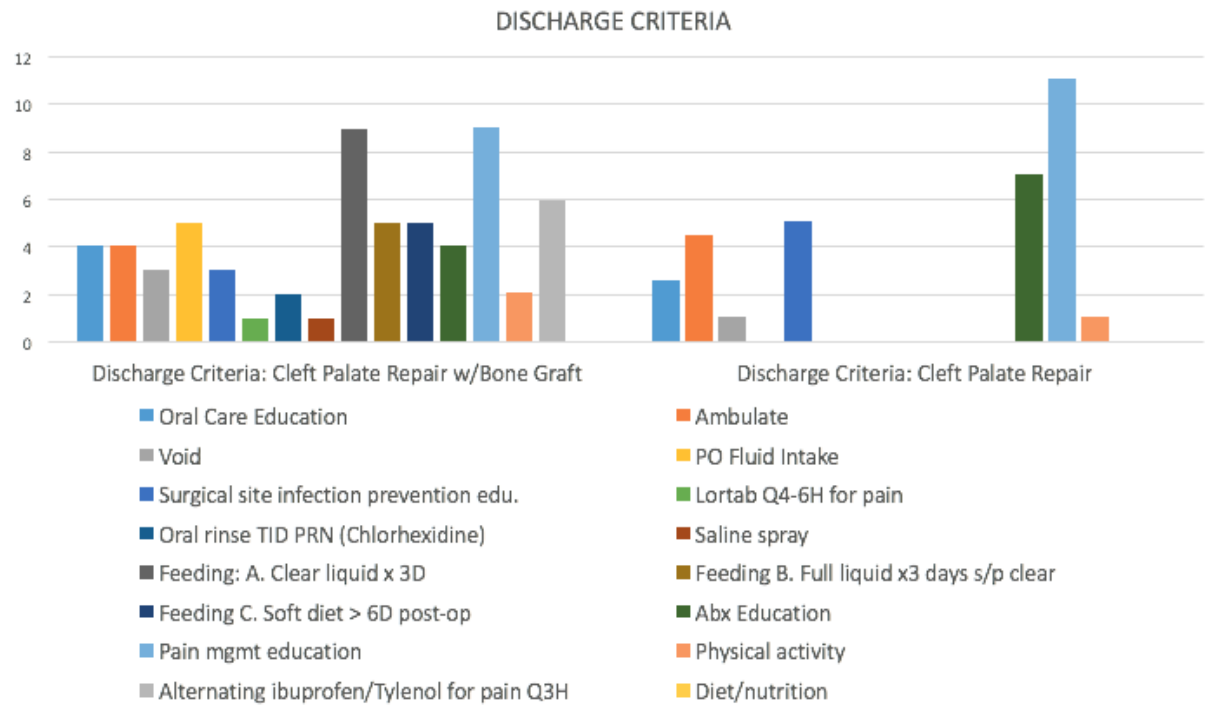
Pureed	IIII IIIIII
Clear liquid	I
Advanced diet (sippy cup, no straws)	

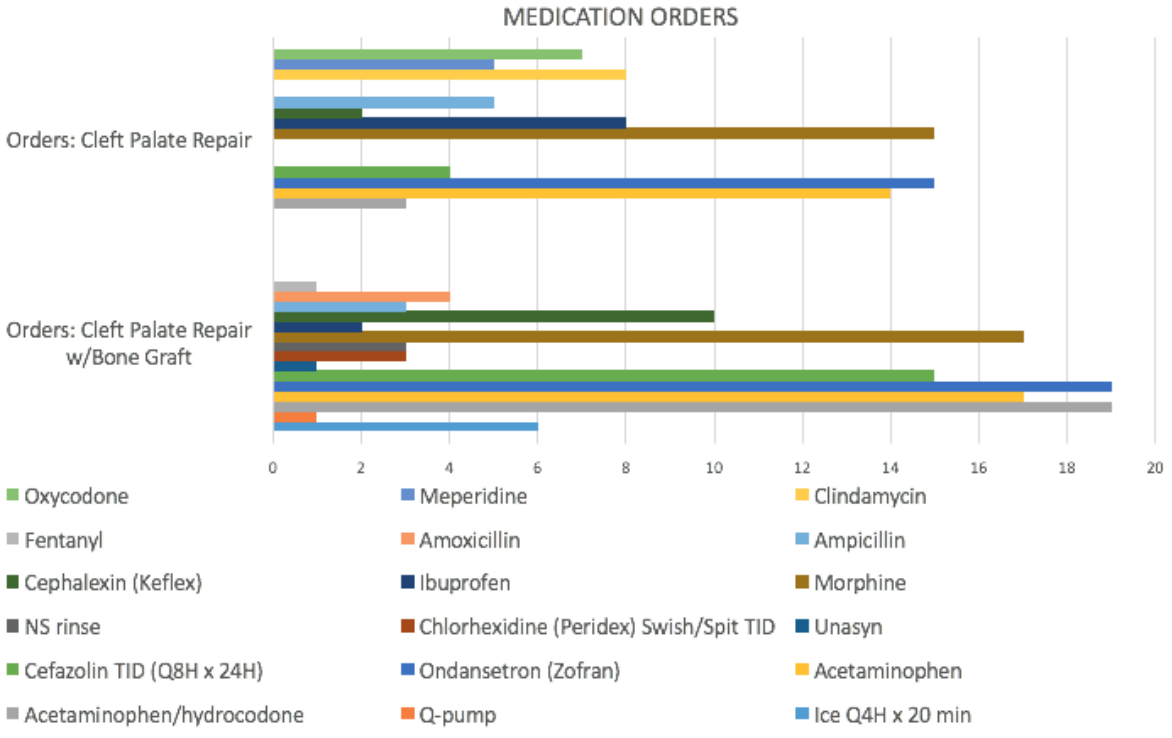
Post-Operative Orders

Is order set present? → yellow box next to order indicates that physician used cleft palate order set→ mark on notes if present or not → Do NOT mark yes if it is from anesthesiology (or another unrelated specialty) order set (If you hold the mouse over the yellow box (Do not click) it will tell you which specialty the order set is related to)

YES	NO
Bone Graft: IIIIIIIIIIIIII Cleft Palate: IIIII	Cleft Palate: IIIIIIIIII Bone Graft: II
F/U: Bone Graft: · Fair – Can't talk very well, pain 4/10, continued swelling, advised to change pain meds from Tylenol to motrin, hand shaking · Fair – eating normal diet, no pain	No bone graft (None)

Chart Audit Data Collection





Appendix F

Standardization of Postoperative Care Guidelines for Pediatric Cleft Palate Patients

PICO Question:
In pediatric cleft palate repair, how does standardization of care through the use of care guidelines, compared to individual physician preference, affect overall care outcomes including: length of stay, first tolerated feed, and pain management?

GOAL Statement:
Create standardized evidence-based care guidelines for cleft palate repairs.

OUTCOMES:

1. Length of stay
2. Pain management
3. Feeding (first tolerated feed)

Postoperative Cleft Palate Repair Care Guidelines

Inclusion Criteria: Postoperative Cleft Palate Repair Patients.
Exclusion: Patients with congenital abnormalities of the heart, brain, or GI system, and PICU admits. Patients with hematology/oncology conditions. Cleft palate repair resulting from palate injury.

Postoperative assessment
(per unit standards of care)

- VS
- Pain Assessment appropriate for age
- Physical Assessment Surgical site assessment

Postoperative Interventions

- IV fluids as ordered
    - D5 ½ NS + 20 mEq/L KCL
    - Until tolerated diet for age
- Apply ice Q4H x 24H x 20 min
    - Apply to the face/appropriate site, while awake
- Oral care as ordered
    - Chlorhexidine Oral Rinse
    - Oral Saline Rinse q4h while awake
- Pain management

- Antibiotic prophylaxis
- Diet restrictions
- SLP Assessment

Medication Management

Antibiotic Prophylaxis

- Cefazolin 30 mg/kg/dose
    - Clindamycin (if allergy present with Cefazolin)
    - Gentamicin (if allergy present with Cefazolin)

Antiemetic

- Ondansetron 0.1 mg/kg/dose IV q8h prn (<40kg)
    - 4mg IV q8h prn (>40kg)

Pain Management

- Acetaminophen
- Ibuprofen
- Acetaminophen/hydrocodone
- Morphine

Recommendations/Considerations

- Indications for extending antibiotic prophylaxis past the 24 hours post op as per CHOC Children's "Antibiotic Prophylaxis for Surgery Guideline"
- Refer to Nursing Policy "Pain Management (Pediatric)" and "Pain Assessment Scales (Pediatric)" include nursing assessment/interventions for pain management.

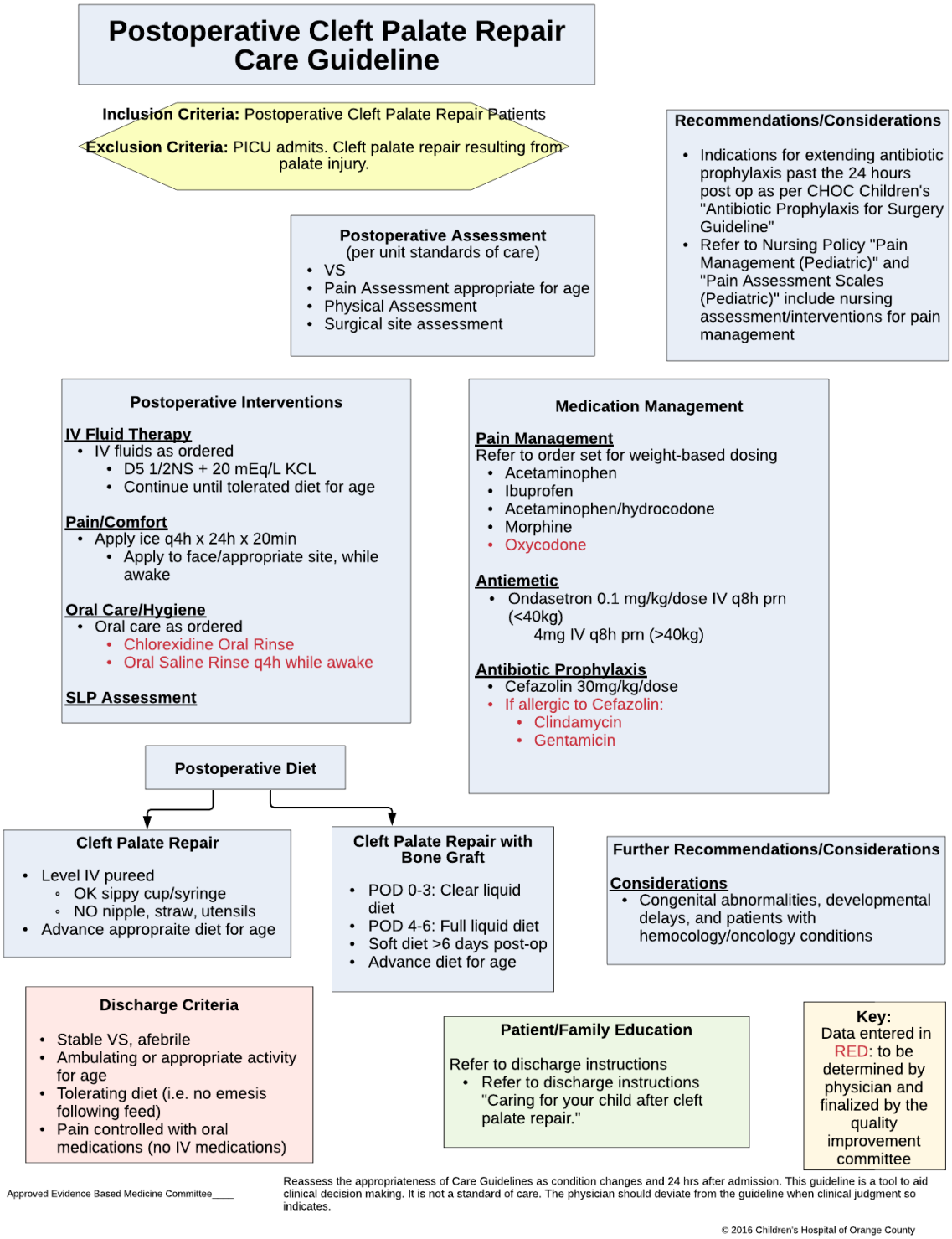
Patient/Family Education

- Refer to discharge instructions "Caring for your child after cleft palate repair."

Discharge Criteria

- Stable VS, afebrile
- Ambulating or appropriate activity for age
- Tolerating diet (i.e. no emesis following feed)
- Pain controlled with oral medications (no IV medications)

Appendix G
Postoperative Cleft Palate Repair Guideline

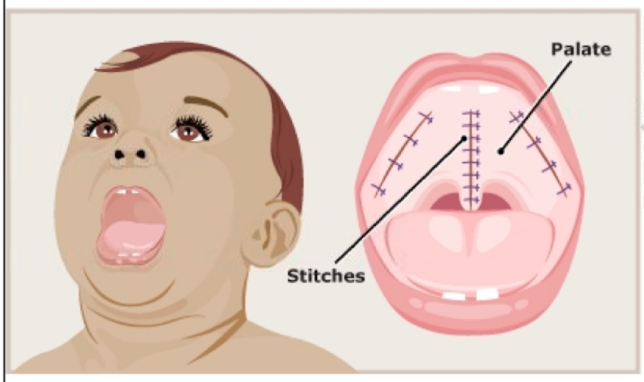


Care Guideline Patient/Family Discharge Education: Caring for Your Child After Cleft Palate Repair

Caring for Your Child After Cleft Palate Repair

Key Point

Cleft palate is treated with surgery to close the opening in the roof of the mouth. Kids who have cleft palate surgery usually recover well and can live normal, active lives.



Your Child's Surgery

A baby with a cleft palate is born with an opening in the roof of the mouth and the nose. This opening may be through just part of the palate (either the soft part or hard part) or through the whole palate.

Your child had surgery to correct the cleft palate. During the procedure, your child was kept asleep and comfortable using anesthesia medicines.

The health care team carefully watched your child while he or she recovered from the procedure and anesthesia. It's now safe to care for your child at home.

When the wound heals, there will be a small scar on the roof of the mouth. The scar usually gets better with time. Your child may still have a gap in the gum area. If needed, your child can have another surgery when he or she is older to help close the gap.

Now that your child has had surgery, your child should be able to eat, speak, hear, and breathe better. This surgery may also help reduce ear infections in your child.

Home Care Instructions

- Feed your child soft or pureed foods with a spoon or a cup. Avoid bottle-feeding unless directed by your child's health care professional.
- Make sure your child sits upright while eating.
- Don't let your child put hard toys into his or her mouth.
- The stitches should dissolve over time, but may be visible for several weeks.
- If your child has pain, a medicine may help:
-
  - **If your child has an ongoing medical problem** (for example, a kidney, liver, or blood problem): Check with your health care professional before giving any pain or fever medicines.
  - **For children younger than 3 months:** Check with your health care professional before giving any pain or fever medicines.
  - **For children 3 to 6 months:** You may give acetaminophen (brand names include Tylenol® and Panadol®).
  - **For children older than 6 months:** You may give acetaminophen (brand names include Tylenol®, Feverall®, and Panadol®) **or** ibuprofen (brand names include Advil®, Motrin®, and Q-Profen®).

Some kids have a sore throat for a few days after surgery. This is from the breathing tube used during anesthesia. If your child seems uncomfortable:

- Give pain medicine as directed.
- Offer cool liquids and soft foods.
- Avoid acidic drinks like orange juice and lemonade, which can irritate the throat.

Special Instructions

- Schedule follow-up appointments with your child's health care professional as directed.
- Some kids with cleft palate may have dental, speech, or hearing problems when they get older. Working with your child's health care professionals, you can get your child get the help he or she needs.

Call Your Health Care Professional if...

Your child:

- Has redness, swelling, or leaking of fluid around the sutures.
- Has pain that becomes severe and doesn't get better with pain medicine.
- Is vomiting (throwing up) and can't keep down food or fluids.
- Starts bleeding from the mouth or nose.
- Gets a fever.

Go to the ER if...

Your child:

- Appears dehydrated; signs include dizziness, drowsiness, dry or sticky mouth, sunken eyes, crying with few or no tears, or peeing less often (or having fewer wet diapers).
- Is having trouble breathing or has noisy or irregular breathing.
- Is hard to wake up.

KidsHealth
Educational Partner

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